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Crayfish NEWS

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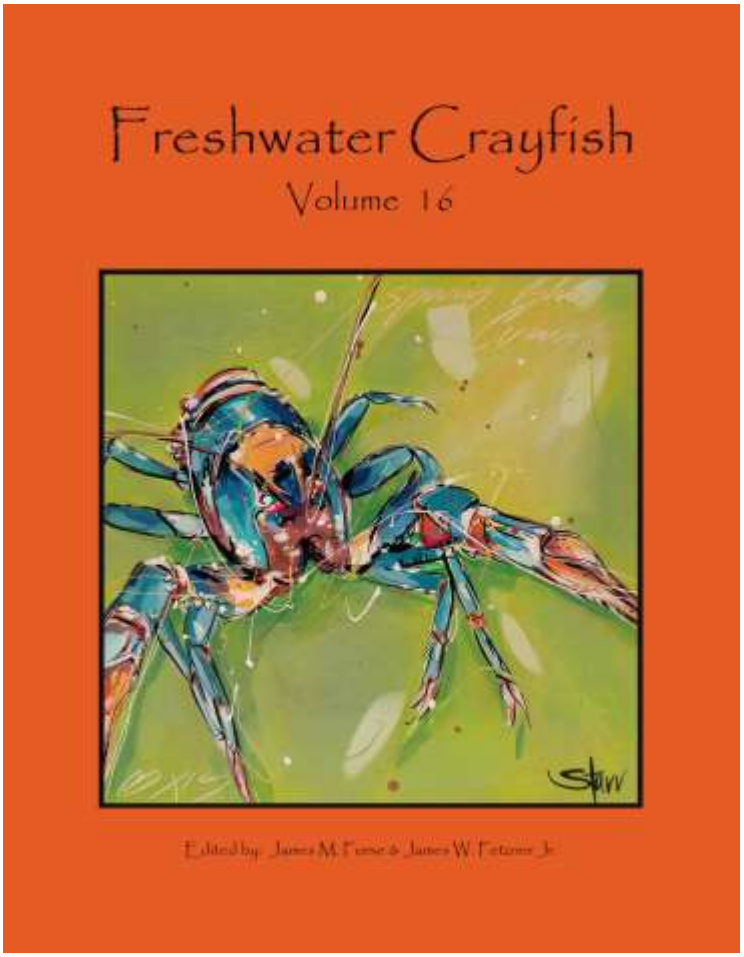
Freshwater Crayfish Volume 16 Now Available



The cover of the newly published *Freshwater Crayfish* 16.

We are please to announce that Freshwater Crayfish 16, the proceedings resulting from the 16th Symposium of the International Association of Astacology that was held in Surfers Paradise, The Gold Coast, Queensland, Australia between the 30th of July and 4th August 2006, has been published by the IAA.

This is the latest in a long line of *Freshwater Crayfish* volumes that extend back over the past 35 years, and this volume incorporates a number of timely updates. These updates include a new format for the papers themselves that brings them into line with mainstream published journals, and a revised set of instructions for authors that will help standardize manuscript submission for this newly implemented journal format. Furthermore, this was the first volume of *Freshwater*

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James M. Furse
IAA President *(Australia)*

President's Corner

Dear IAA members:

As this is the first *Crayfish News* for 2009, I would like to wish you all a very successful and Happy Year for 2009, and I trust you all had a most enjoyable festive season. Since my last message many IAA members, in both Hemispheres, have experienced some particularly severe weather events, some disastrous. Over the last few months various regions of Australia have experienced widespread flooding, severe heatwaves, and here in Queensland a very near-miss from a category 5-cyclone (but sadly, not 100 km from where I am sitting: a direct "hit" from an oil spill). Very sadly, and as I am sure you are aware, the severe weather conditions in Southern Australia led to a terrible loss of life in the Victorian Bushfire tragedy. Thankfully, I am happy to report that our IAA members, and their families, from that region are all safe and well. I trust that our members from Northern Australia have managed to dry out after the floods, and our members from the Northern Hemisphere have thawed out after the severe cold weather, or are starting to thaw with the onset of spring.

I am reliably informed that the manuscript submission and review process for *Freshwater Crayfish 17* is forging ahead, with a good number of reviewers having already completed their duties in a timely fashion. I think the willingness of IAA members to review manuscripts for *Freshwater Crayfish* is another wonderful indication of the very close-knit nature of the IAA and its members.

To me, one of the many highlights of being a member of the IAA, is when the IAA family gets together at our biennial IAA symposiums. Of course, IAA18 in Columbia Missouri (USA) is now only just over a year away, in July 2010. I have been in very close contact with the IAA18 organising team, they are very busily doing a magnificent, and very thorough job, of making preparations for the big event. As with all IAA symposia (and with a bit of inside knowledge on what is planned), I can assure you that IAA18 is promising to be another fantastic event: I can hardly wait to get there (and have been saving money furiously). Obviously we are experiencing some particularly difficult financial times, but nevertheless, I encourage all IAA members to do whatever they can to attend IAA18, as I know it will be well worth it. As a final IAA18 side-note, I understand that IAA18 team member, Chris Taylor, has been busily honing his pumpkin-pie recipe to the razor's edge of perfection: I am looking forward to a taste of that pie!

The set-up of the IAA on-line credit card payment facility (PayPal) that I have been mentioning in the last few issues of *Crayfish News* is still underway. One major administrative hurdle that is presently being dealt with,

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The International Association of Astacology (IAA), founded in Hintertal, Austria in 1972, is dedicated to the study, conservation, and wise utilization of freshwater crayfish. Any individual or firm interested in furthering the study of astacology is eligible for membership. Service to members include a quarterly newsletter, membership directory, bi-annual international symposia and publication of the journal *Freshwater Crayfish*.

Secretariat:

The International Association of Astacology has a permanent secretariat managed by Bill Daniels. Address: IAA Secretariat, Room 123, Swingle Hall, Department of Fisheries and Allied Aquacultures, Auburn University, AL 36849-5419, USA.

Tel: +1(334) 844-9123 / Fax: +1(334) 844-9208
E-mail: daniewh@acesag.auburn.edu

Web page: http://iz.carnegiemnh.org/crayfish/IAA/
Webmaster: James W. Fetzner Jr.
E-mail: FetznerJ@CarnegieMNH.Org

IAA Board Members:

In addition to the IAA Officers, the board includes Arnie Eversole (USA), Paula Henttonen (Finland), Jay Huner (USA), Julian Reynolds (Ireland), Stephanie Peay (UK) and Alastair Richardson (Tasmania).

Officers:

James M. Furse, President, Griffith School of Environment Gold Coast Campus, Griffith University, Queensland 4222, Australia.
E-Mail: j.furse@griffith.edu.au

James W. Fetzner Jr., President-Elect, Section of Invertebrate Zoology, Carnegie Museum of Natural History, 4400 Forbes Avenue, Pittsburgh, PA 15213-4080. United States of America.
E-Mail: FetznerJ@CarnegieMNH.Org

Leopold Füreder, Secretary, Institute of Ecology, University of Innsbruck, Technikerstr. 25, A-6020 Innsbruck, Austria.
E-Mail: leopold.fuereder@uibk.ac.at

Catherine Souty-Grosset, Immediate Past-President, Université de Poitiers, Ecologie, Evolution, Symbiose, UMR CNRS 6556, 86022 Poitiers Cedex, France.
E-mail: catherine.souty@univ-poitiers.fr

This issue edited by James W. Fetzner Jr.

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is the fact that the IAA does not currently have Tax-Exempt status in the USA. The IAA does meet the criteria for a Tax-Exempt Organisation, however the application process is definitely a non-trivial exercise. The IAA Secretariat and Officers are working on the application. Unfortunately, we are not able to predict when we anticipate the PayPal facility will become available beyond "as soon as possible": it will be worth the wait though.

A couple of final administrative notes: It appears that the contact details for a good number of IAA members are not current: in particular e-mail addresses. Of course this complicates (or in some cases prevents) the dissemination of important information and announcements to the membership. Please kindly take a moment to login to the IAA website and check, and correct, your contact details if required. I also understand that some members are not current with their membership fees, please kindly check your records, and if required, pay your membership dues. The price of being a member of the IAA is very reasonable, and of course the Association relies on these funds to remain operational.

My very warmest regards to you all from the slightly less hot and humid Gold Coast. H

James M. Furse
IAA President
Griffith University
The Gold Coast, Australia
j.furse@griffith.edu.au

IAA Related News

News about IAA18
Columbia, Missouri, USA

The organizing committee has been busy updating the IAA18 website (http://muconf.missouri.edu/IAA18/index.html). We hope that the updated site will be on-line in early April 2009. Future meeting participants will find information about important dates for registration, housing and abstract submittal, as well as information about the meeting venue, housing, and travel. We hope to have registration costs on the website by Fall 2009 (spring for those down-under).

In addition to firming up logistics for the meeting, the organizing committee has been working hard to gather sponsorship from several sources and despite economic hard-times; we received good news in the form of donations from several sponsors.

Finally, the local organizing and advisory committee would appreciate your responses to a short survey to determine your level of interest in attending IAA18. You can access the survey at http://muconf.missouri.edu/survey/TakeSurvey.aspx?SurveyID=98KJlo2. We look forward to hearing from you and truly appreciate your participation! H

The IAA18 Organizing and Advisory Committees

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Crayfish to be produced electronically using the IAA's new online Manuscript Submission and Tracking System. These various changes were implemented in order to standardize the look, format, and speed of production of future volumes of *Freshwater Crayfish*, this new streamlined process should help future authors, reviewers, and editors alike.

This volume contains 21 papers and a bibliography of all papers appearing in past volumes of *Freshwater Crayfish* with a total of x + 202 pages. Additional information about this volume, such as paper titles and abstracts, can be viewed online via the IAA website at http://iz.carnegiemnh.org/crayfish/IAA/fc16_toc.htm. Members can purchase a print copy of this volume for US $14.00 + shipping. Electronic PDFs and CD versions will be made available to members via the IAA website at a later date.

Contact the IAA Secretariat (Bill Daniels, daniewh@acesag.auburn.edu) about obtaining your own copy of *Freshwater Crayfish* 16 today.

We hope that you enjoy the new format of our society journal as well as the contents that appear within the pages of *Freshwater Crayfish* 16. We really wanted to update the format of *Freshwater Crayfish* 16 to give it the look and feel of a high quality journal, we would love to hear your comments, good or bad, on this latest version.

Copies were mailed to all "full" delegates who attended IAA16, all 1st authors of the papers, and all reviewers who contributed to this volume. Sadly, many of the copies appear to have been lost in the post. If you fall into one of these groups and have not received your copy of *Freshwater Crayfish* 16 in the mail, please kindly email James Furse (j.furse@griffith.edu.au) and we will arrange for another copy to be sent. H

Our best regards
The Editors,
James Furse and James Fetzner

Short Articles

Conservation of White-clawed Crayfish *Austropotamobius pallipes*, in South West England

The white-clawed crayfish (WCC), is Britain's only native species and has suffered severe declines, most devastatingly in recent decades due to the spread of non-native crayfish species (NNCS) and associated 'crayfish plague'. In Britain, the number of 10km grid squares occupied by NNCS overtook those occupied by white-clawed crayfish in 2003. In particular, South West England (where NNCS were first farmed for food) has experienced a rapid decline. For example, three out of four of its most abundant populations have been lost in the past three years alone, and now less than 20 populations remain in the region.

In October 2008, England's statutory nature conservation organization, Natural England, awarded funding to Bristol Zoo (lead partner), Avon Wildlife Trust and the Environment Agency for a three-year project to implement at the landscape scale, active mitigation from the threat of NNCS by identifying a number of suitable refuge or 'Ark' sites (Figure 1) in the region so as to safeguard the species' future. The work builds on efforts by the Environment Agency and Avon Wildlife Trust over the past ten years to assess the distribution and status of native crayfish in the region, which also included the first know translocation to a lotic Ark site in England in 2006.

It is crucial to the success of this work that it takes place at the river catchment scale and links with other relevant initiatives. The work is also in line with supporting measures in existing River Basin Management Plans for the Water Framework Directive, though it is outside the scope of the project to attempt any form of direct control against populations of NNCS. The project will also attempt a trial captive breeding program at Bristol Zoo Gardens, as this aspect could be crucial in future conservation efforts.

The primary aim of the project is to identify all remaining white-clawed crayfish in the southwest and prioritize them in terms of threat. Ark sites will then be identified by working through detailed ark site selection criteria, and then threatened potential donor populations will be linked to potential ark receptor sites throughout the region. A series of translocations will be carried out in order to try and safeguard all remaining threatened white-clawed crayfish populations.

The secondary aim of the project is to establish and maintain viable breeding populations of white-clawed crayfish *ex situ*, in order to provide plague free brood stock. This system will be installed at Bristol Zoo Gardens and linked to an on-show exhibit within the Zoo Aquarium. Another key element of this captive breeding project is to raise public awareness by engaging visitors in this initiative.

A targeted education program will run alongside the project highlighting key white-clawed crayfish threats, as well as publicly promoting measures for their conservation. This will include the development of a regional awareness campaign, including outreach programs to fisheries and landowners, Bristol Zoo educational sessions and interpretative exhibits, the development of a media campaign, and production of updated publicity materials. As part of the communication strategy, the project will be hosting an international crayfish conference in the autumn of 2010.

Critical success factors required for translocations and captive breeding will be identified, recorded, published and disseminated to stakeholders and partners responsible for the maintenance of the species and its habitat. The project will also drive UK BAP conservation targets and contribute to EU WCC conservation targets such as increasing the range of white-clawed crayfish. Both existing and potential white-clawed crayfish habitats in the southwest will be examined in order to work towards creating new site designations wherever possible.

Other project partners include Buglife (UK's invertebrate charity), Bristol Water (utilities company) and expert consultants. H

Jen Nightingale
South West White-clawed Crayfish Project Leader
jnightingale@bristolzoogardens.co.uk

Figure 1. Southwest white-clawed crayfish ark site.

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Notes on the Piedmont Blue Burrower, *Cambarus harti*

Introduction and Methods

The Piedmont Blue Burrower, *Cambarus harti,* is a primary burrowing crayfish listed as endangered by the state of Georgia, USA. It is distinguished by its blue coloration, small eyes, and narrow areola. This species has a limited range and habitat specificity and is only found in the Piedmont region of the Chattahoochee and Flint River basins in Meriwether County, Georgia.

Crayfish were collected in 2007 & 2008 by burrow excavation or by avian mist net (see Welch and Eversole 2006) from two areas approximately 100 m apart in seepage sandy areas (approximately 900 m^2) rich in organic matter near two spring-fed streams. Roots from surrounding vegetation (e.g., red maples, giant cane) support the burrows. Sex of the individual, carapace length and width, chela length (lateral margin of palm) and palm width of the right chela were recorded. Chimney characteristics (e.g., size, shape, and structure) and burrow openings were noted.

Results and Discussion

Twenty two crayfish were collected and size of individuals ranged from 6 mm to 29 mm in carapace length. First form males (n = 5) were collected from April through November. No females in berry were collected. The smallest crayfishes were captured in November and December of both years. Two juvenile crayfish were collected from the same burrow on two separate occasions. Crayfish capture success using mist nets was less than one crayfish captured per 15 burrowing nets set, however use of this trapping method did reduce the damage to burrows and the impact on the habitat compared to digging.

Color notes - Crayfish carapace color varied from dark cobalt blue to a rusty pink/violet color. Individual crayfish had variation in carapace color similar to that describe in Hobbs (1981). Two juveniles had a magenta tint when collected but became a darker blue hue after a month in captivity.

Photo 1. *Cambarus harti*, The Piedmont Blue Burrower. Photo by Chester R. Figiel, Jr.

There is concern for *C. harti* vulnerability to extirpation due to habitat changes, destruction or degradation. For example, the site where Hart and Hart (1974) captured individuals has been altered due to logging operations and the species may be gone from that location. Additionally, this species is an obligate burrowing crayfish and may be susceptible to climate changes related to drought. Sampling efforts during 2007 and 2008 were made during drought-like conditions and it is unknown if this factor affected crayfish foraging behavior, growth, body size, and reproduction. Reduced rainfall may have resulted in changes in soil moisture, prey availability, burrowing ability, or crayfish movement. Because of its highly specialized life history and because of the small natural range of this species, understanding the threats that disrupt natural processes is critical to conserving this species. Further studies will attempt to identify basic ecology and behavior of these crayfish starting with population estimates and seasonal differences. Additionally, studies on habitat requirements and genetic variability are needed for continued *C. harti* conservation efforts. H

Chester Figiel, Jr.
Warm Springs Regional Fishery Center
U. S. Fish and Wildlife Service
Warm Springs, Ga. USA 31830
chester_figiel@fws.gov

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Traditional Laundry Becomes Crayfish Killer (Cândeni Case Study)

In Romania, there are three native crayfish species: Stone Crayfish (*Austropotamobius torrentium*), Noble Crayfish (*Astacus astacus*) and Long-clawed Crayfish (*Astacus leptodactylus*).

The Cândeni Stream is the last tributary in the Caraş hydrographic basin, and it is situated near the limit of the Nera hydrographic basin. Noble Crayfish live in most of the Caraş hydrographic basin tributaries, except for Buhui Spring and Cândeni Stream, where Stone Crayfish live [old observations

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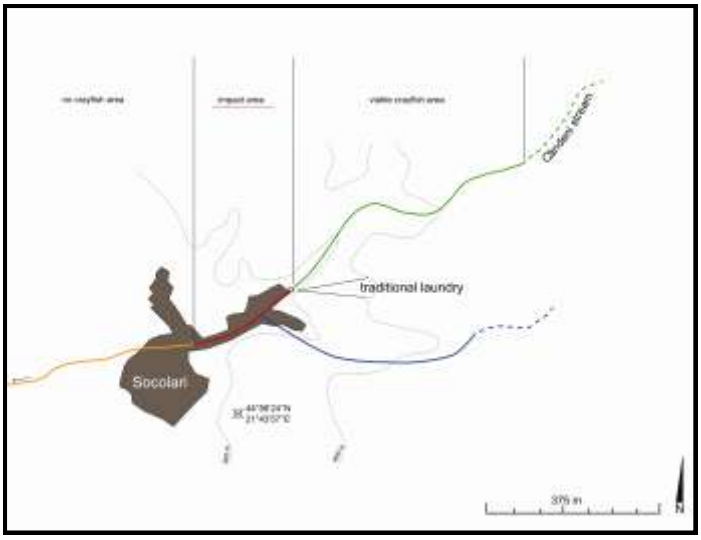

Figure 1. Map showing the location of study area.

mention another tributary with Stone Crayfish – Ponicova Stream (Băcesu 1955), but nowadays only Noble Crayfish live there]. Today, only Stone Crayfish are found in the Nera hydrographic basin (personal observations).

Thus, the crayfish population from Cândeni Stream is either a remnant of the old population of the Caraş basin, or it might be a natural or artificial expansion of the populations from the Nera basin.

Regardless of where it came from, this crayfish population is in big danger. On the 25th of November 2008, over 93 Stone Crayfish were found dead, or almost dead, in the middle of Socolari (a small village with traditional peasant houses) which Cândeni Stream flows through (Figure 1). Upstream investigations have revealed the existence of perfectly viable crayfish. Therefore, the only explanation for these die-offs is the use of modern detergents in a traditional laundry (located at the stream's entrance in the village), or in the households situated on the banks of the stream.

We consider this a very dangerous situation for this already vulnerable species (Pökl & Streissl 2005) because such chemical releases may occur again in the future. When analyzing the dead specimens we noticed that male crayfish predominated. The period of time when the observations were made corresponded to the courtship period. The greater number of male crayfish is likely due to their more intense activity while out looking for a females (Maguire et al. 2002). A large number of juveniles were also found, probably because these crayfish found an empty habitat (as a consequence of the possible release of pollutants), and they quickly occupied the new territory. The release of pollutants into the stream is probably ongoing and the new crop of crayfish that were caught downstream of the impacted area (Figure 1) will likely die when pollutants are released again.

Therefore, the population of reproductive age Stone Crayfish in that stream is continuously diminishing as a result of pollution. At a relative population density of 2.35 individuals/m^2 (established during normal conditions), and taking into account the stream's length, the mortality of specimens represents 5.5% of the entire population. As a result, it would take 12 similar events on that stream to cut the entire reproductive population of this vulnerable species in half. Considering that during the summer time the flow of the stream can completely dry up in the limestone areas, it is a miracle that the Stone Crayfish hasn't already completely disappeared from Cândeni Stream.

To conclude, we have brought this important matter to the attention of the local authorities who should take corrective measures in order to stop the release of pollutants into the stream (which is prohibited by law) by educating the locals (Puky et al. 2002), and by following the minimum measures outlined for the species preservation and management (Pârvulescu in Combroux et al. 2007). Maintaining favorable conservation status presumably means making sure that the habitat stays favorable for the crayfish to breed (Holdich et al. 2002). H

Lucian Pârvulescu
Chemistry, Biology and Geography Faculty
West University of Timisoara
parvulescubio@yahoo.com

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Photos sent in from IAA member David Baldry (France). A, Ventral and dorsal view of the first male *O. limosus* trapped this year (1 March). Its very dark color is typical of individuals that become active as spring approaches. B, This male resembles the previous one. The corneous tips of the first gonopods clearly visible on this individual, confirm that it is a Form I male. C, Last year I found a few *O. limosus* that had their rostrum destroyed, presumably by overly aggressive males. What is surprising is that some very severe rostral injuries (leaving the optic nerves and part of the brain exposed) were not immediately fatal. D, On 8 September 2008 the *O. limosus* that were kept under observation in one of my garden tanks, suddenly started wrestling with each other to climb out of the water onto some floating clumps of Water Hyacinth! H

Books & Multimedia

New Website – Crayfish of Romania

Starting in March 2009, a new open access website is available at http://www.crayfish.ro/ as a response to the need of scientific information related to crayfish in Romania. The site is virtually an open book where you will be able to find information on crayfish distribution and images of native and invasive species, as well as various aspects related to crayfish issues and habitats in Romania, crayfish news and much more. Species distribution is a priority, and Google Earth maps are being constantly updated accordingly. The site also features a list of Romanian and foreign publications related to the crayfish of Romania. Open access is available for the majority of these works (in pdf format), provided that the authors have given their consent to it. H

Lucian Parvulescu
West University of Timisoara
parvulescubio@yahoo.com

Crayfish Blogging and Citizen Science

Marmorkrebs are the mysterious all-female crayfish that showed up in German hobbyists' tanks in the mid-1990s. Marmorkrebs are attracting attention for reasons both good and bad. My own research interests led me to get Marmorkrebs for my lab, and soon afterwards, I created the website, Marmorkrebs.org (also known as marbledcrayfish.org). Although I initially created the website to provide resources for researchers, but am increasingly trying to use the site to engage crayfish pet owners to provide information for researchers.

A regularly updated blog is one of the key features of the Marmorkrebs.org website. Although it focuses on Marmorkrebs, it has other posts related to crayfish research more generally. The blog is updated at least weekly, has been well-received. In particular, one post, "How Marmorkrebs can make the world a better place," was one of 50 entries selected from over 800 nominations for The Open Laboratory 2008, the third annual anthology of the best science writing on blogs (Rohn 2009).

The good news concerning Marmorkrebs is that it is attracting increasing interest for its potential uses in research (Vogt 2008). That Marmorkrebs are genetically identical makes it a potentially excellent genetic and developmental model for decapod crustacean research, areas of biology in which research progress for decapods has notably lagged behind that made for other species.

The bad news is that Marmorkrebs are also attracting attention as a potential pest species. Marmorkrebs have already been introduced in Madagascar, where they may pose a threat to endemic crayfish (*Astacoides* spp.) (Jones et al., in press).

A similar introduction of Marmorkrebs into North American waters feels almost inevitable. Through requests for feedback on the blog and monitoring other websites, it is clear that Marmorkrebs have been available to hobbyists

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in North America for some time now. I am currently trying to track down how and when Marmorkrebs were introduced into the North American fish hobby circuit. I have placed a survey for pet owners on the main page of Marmorkrebs.org, and responses are slowly but surely coming in. I hope that this information may help assess what areas might be at risk of Marmorkrebs being introduced.

I welcome inquiries from researchers interested in studying these wonderful crayfish. Likewise, if any readers receive queries about Marmorkrebs from hobbyists, please ask them to contact me through the Marmorkrebs.org website. H

Zen Faulkes
Department of Biology
The University of Texas-Pan American
Edinburg, Texas, USA
zfaulkes@utpa.edu

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New Web Site and Poster Raise Awareness about Plight of Mississippi Crayfishes

Oxford, MS – The U.S. Forest Service Southern Research Station (SRS) today unveiled a new Web site, http://maps.fs.fed.us/crayfish/, and poster dedicated to Mississippi's crayfishes (also known as crawfish, crawdads, or mudbugs) in hopes of increasing public awareness about the decline of these ecologically important species. With more than 63 native species, Mississippi is a global hotspot for crayfishes.

"The State of Mississippi has determined that nearly 30 percent of the state's crayfishes are in need of immediate conservation action or research," said Susie Adams, an SRS fisheries research scientist based in Oxford, MS, and coordinator of the Web site and poster. "My hope is that the Web site and poster will educate people of all ages about the significant roles that crayfishes play in the natural world, as well as promote conservation measures."

Mississippi possesses one of the richest collections of crayfishes in the world. Seventeen of the state's crayfish species are found nowhere else, and at least 10 species have yet to be scientifically described and named. Crayfishes live in a wide range of habitats, including wetlands, lakes, streams, roadside ditches, and even relatively dry savannahs, lawns, and agricultural fields throughout the eastern United States. Some crayfishes live most of their lives in open water, while others live primarily in burrows as deep as 10 feet. A couple species are prized food items for many, especially in southern Louisiana. Crayfishes, which are crustaceans related to lobsters, shrimps, and crabs, also are used as fish bait and in laboratory studies.

Crayfishes play an important ecological role by serving as food for numerous animals including sport fish like smallmouth bass, and many mammals and birds. Additionally, crayfishes eat live and dead animal and plant material, which is important for recycling decaying matter in food webs. Unfortunately, many crayfishes have declined over the years because of habitat loss, pollution, and invasive

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species.

The "Crayfishes of Mississippi" Web site, http://maps.fs.fed.us/crayfish/, serves as a useful resource for experts, science teachers and students, and others interested in learning more about crayfishes. Through the Web site, scientists, managers, and planners can obtain a username and password that allows them to obtain data records and map crayfishes site locations to assist with land management or planning decisions or research. Teachers and students will find the general information and distribution maps of crayfishes useful in developing curricula, conducting project research, or simply learning more about an ecologically important group. The maps are interactive and contain county-by-county lists of species. Users can access low- and high-resolution, colorful images of many of Mississippi's 63 crayfishes. Adams based the Web site on data from her own research as well as from the Mississippi Museum of Natural Science, Smithsonian National Museum of Natural Science, and the Illinois Natural History Survey.

The attractive poster features close-up photographs of more than 30 Mississippi crayfishes, as well as important information about the species. The poster also encourages readers to preserve crayfishes habitat and to only release crayfishes into the waters in which they were captured. The poster is available online at http://maps.fs.fed.us/crayfish/articles/crayfish-posterFINAL8_2008.jpg. The public can request free posters from the Mississippi Museum of Natural Science using the following information: H

Mississippi Museum of Natural Science
2148 Riverside Drive
Jackson, Mississippi 39202-1353
Phone: 601-354-7303
Fax: 601-354-7227
www.msnaturalscience.org

Susan Adams
SRS Center for Bottomland Hardwoods Research
sadams01@fs.fed.us

News Items From Around the World

Australian researchers test honesty in crayfish

Researchers in Queensland have found that females are more honest, at least among crayfish.

A study by the University of Queensland's Moreton Bay Research Station has found male crayfish with large claws are tricking their opponents to think they're stronger fighters.

Doctor Robbie Wilson says that's despite tests showing size doesn't guarantee strength... and that the larger clawed [cray]fish are only winning through intimidation.

But he says it's only the male crayfish that seem to push the boundaries.

"It's completely opposite in the females. If they show large claws they're going to be strong. So the females are going to be truthful, while the males are lying about how strong they are." H

Australian News Network

Nashville Zoo Wins the 2009 IAATE Conservation Award as Well as a $500 Donation

Nashville, TN - The International Association of Avian Trainers and Educators (IAATE) presented Nashville Zoo with the 2009 Conservation Award as well as a $500 donation. The award recognizes IAATE members' avian conservation efforts in the field as well as in zoos and other avian facilities.

The Zoo's Friends of Animals at Nashville Zoo (FANZ) Club received the award for their support of the Tennessee Parks and Greenways Foundation in 2008. The Zoo founded the FANZ club last year as a conservation initiative tied to its educational animal shows. Guests purchase collectible cards and pins featuring animals in the shows, like Jane the hornbill or Isabella the Burmese python. All proceeds benefit conservation efforts.

This year, the FANZ Club is sponsoring the Nashville Crayfish Project. The Nashville crayfish [*Orconectes shoupi*] is federally endangered, and its habitat has diminished to a small range in the heavily industrialized Mill Creek watershed. The project focuses on protecting the crayfish's natural habitat as well as developing a conservation and breeding program. Nashville Zoo spearheaded the project in collaboration with the Tennessee Department of Environment and Conservation (TDEC), Tennessee Wildlife Resources Agency (TWRA), and the U.S. Fish and Wildlife Service (USFWS).

IAATE fosters communication, professionalism and cooperation among individuals promoting avian science through training, public display, research, husbandry, conservation and education. Conservation Award applicants are evaluated on the: project's impact on avian conservation, extent of IAATE involvement, use of creative or innovative methods, and sustainability of the conservation effort.

Nashville Zoo is accredited by the prestigious Association of Zoos and Aquariums, assuring the highest standards of animal care and husbandry. The Zoo is a non-profit organization located at 3777 Nolensville Road and is open every day except

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Thanksgiving, Christmas and New Year's Day. The mission of Nashville Zoo is to inspire a culture of understanding and discovery of our natural world through conservation, innovation and leadership. For more information about Nashville Zoo, call 615-833-1534 or visit www.nashvillezoo.org. H

Article By Jim Bartoo
Nashville Zoo

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Crawfishes of Louisiana
By Jerry G. Walls

Everyone in Louisiana knows something about crawfish—especially how tasty they can be when boiled with just the right combination of spices. Yet these small crustaceans—known as "crayfishes" by scientists and "mudbugs" by many fishermen—offer more than a delicious meal. In Crawfishes of Louisiana, Jerry G. Walls identifies the state's thirty-nine types of crawfishes, explains their biology, and explores their importance in Louisiana's history, culture, and economy.

Walls briefly describes each species and subspecies of crawfish currently known to live in Louisiana, as well as their natural history and complicated breeding biology. Detailed illustrations depict pertinent taxonomic features, color photographs of living specimens aid in identification, and maps indicate species distribution throughout the state. Two identification keys further assist users in classifying any crawfish they encounter. Drawing on his experiences collecting crawfishes over the past fifty years, Walls explores changes in their populations and in the environmental health of their habitats.

In the early part of the twentieth century, many Louisianans thought eating crawfish outside of Lent was an embarrassing admission of poverty. Now crawfish is a celebrated delicacy in restaurants and at festivals offering crawfish boils, crawfish races, crawfish cook-offs—even the election of a crawfish queen and court. Crawfish provide recreational fishing opportunities in ditches and lakes across southern and central Louisiana, and commercial fishermen net roughly 70,000 tons of crawfish each year and process them in a fishery employing over 2,500 people. Walls offers insights into all of these areas along with cooking tips and recipes and, at the other extreme, instructions for keeping crawfish as pets.

Crawfishes of Louisiana is an invaluable and enjoyable resource for all fans of this famous Louisiana crustacean.

This book is being made available to IAA members at a 30% discount off the cover price. Instructions for ordering with a discount code are given below.

IAA members may order CRAWFISHES OF LOUISIANA online at http://www.lsu.edu/lsupress/bookPages/9780807134092.html.

INSTRUCTIONS FOR ORDERING AND RECEIVING DISCOUNT

From the CRAWFISHES OF LOUISIANA page, select "Add paper to cart" and then select "CHECKOUT." When you arrive at the "Secure Checkout" page, you'll be able to enter your "Discount Code." Please enter Discount Code "04THIRTY" (without quotes) and select "Update" before placing your order.

Meeting Announcements

Regional European Crayfish Workshop: Future of Native Crayfish in Europe

7th-10th September 2009, Písek, Czech Republic

The registration is now open!!!

If you want to contribute to the discussion about the actual situation of indigenous and non-indigenous crayfish in Europe, register now at:
http://www.vurh.jcu.cz/crayfish_workshop/

The focus of the workshop will be on:
- Conservation of indigenous crayfish (IC)
- Culture and reintroductions of IC
- Risk assessment and management of IC
- Biology of IC and non-indigenous crayfish (NIC)
- Environmental and ecological impacts of NIC
- Impact of habitat alteration
- Impact of crayfish diseases

Keynotes, oral presentations and poster sessions will make up the forum for the dissemination of information during the workshop. Authors of selected abstracts from the proceedings of the workshop will be invited to submit a full paper for publication in a special issue of the journal Knowledge and Management of Aquatic Ecosystems.

We offer you scientific knowledge, a friendly atmosphere, a social program (including welcome drink and workshop party), and an interesting field trip.

With kindest regards,
Organizing Committee

Plenary Speakers
- Shizuo Akira (Osaka, Japan)
- Richard A. Flavell (New Haven, USA)
- Elena A. Levashina (Strasbourg, France)
- Dietmar Schmucker (Boston, USA)
- Christopher Secombes (Aberdeen, UK)

Symposia & Workshops
- Innate immunity in vertebrates; cytokines and chemokines
- T cel receptors and function
- Pattern recognition molecules and immune sensors of pathogens
- MHC
- Immunoglobulin superfamily and evolution of immunoglobulins
- The question of adaptivity in innate immunity in invertebrates
- Anti-viral immunity
- Complement and complement-like factors
- Parasite-vector interactions/Parasite immunity
- Immunomodulation and prophylactic strategies, vaccines
- Shellfish Immunity
- Ecoimmunity
- Biotechnological applications from comparative immunology
- Arthropod immunity
- Linking innate and adaptive immunity
- Signal transduction pathways in Immune recognition
- Innate immune cell, apopotosis, growth factors
- ISDCI History

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IMPORTANT DATES

- Early registration deadline: 30 April 2009
- Submission of abstracts (all symposium papers, keynote addresses, and contributed papers): 30 April 2009

http://wwwsoc.nii.ac.jp/csj4/TCSFirstPage1.html
Tokyo University of Marine Science and Technology, Shinagawa

For general sessions, we invite contributions in all areas of crustacean biology.

TWO TYPES OF CONTRIBUTED PAPERS

1. General contributed papers: All subjects of crustacean biology for any taxonomic group.
2. Symposium-related contributed paper : If you have an interest in one of the symposia organized (see below), you can take part in it as "symposium-related contributed paper". Please ask the organizer of the symposium first. The contact e-mail address is on the bottom line of each symposium web-page at http://wwwsoc.nii.ac.jp/csj4/TCSFirstPage1.html.

Symposia

- Life History Migrations of Freshwater Shrimps: Ecological and Adaptive Significance (Raymond T. Bauer, Univ. Louisiana, U.S.A. & Hiroshi Suzuki, Kagoshima Univ., Japan)
- Phylogeography and Population Genetics in Decapod Crustacea (Christoph D. Schubart, Univ. Regensburg, Germany)
- Speciation and Biogeography in Non-Decapod Crustaceans (Christoph Held, Alfred Wegener Inst. Polar Mar. Res., Germany)
- Biology of Anomura III (Fernando Mantelatto, University of São Paulo, Brazil & Christopher Tudge, American University & Smithsonian Institution, U.S.A.)
- Crustacean Chemoreception: Identification of Cues and their Applications (Charles Derby, Georgia St. Univ., U.S.A., & Miguel V. Archdale, Kagoshima Univ., Japan)
- Integrative Biology: Crustaceans as Model Systems (Antonio Baeza, Smith. Trop. Res. Inst., U.S.A.)
- Ecology and Behavior of Peracarids: Progress and Prospects (Masakazu Aoki, Tsukuba Univ., Japan) and Martin Thiel (Univ. Católica Norte, Chile)
- Reproductive Behavior of Decapod Crustaceans (Keiji Wada, Nara Women's Univ., Japan, & Satoshi Wada, Hokkaido Univ., Japan)
- The New Perspective on Barnacle Research (Toshi Yamaguchi, Chiba Univ, Japan.)
- Symbiosis in Crustaceans: Diversity and Evolutionary Trends (Susumu Ohtsuka, Hiroshima Univ., Japan)
- Current Status of Fisheries and Biological Knowledge of Snow and Tanner Crabs Genus *Chionoecetes* in the World (Hiroshi Motoh, Japan)
- Diversity and Ecology of Thalassinidean Shrimps (Gyo Itani, Kochi Univ., Japan)
- Impacts of Human Exploitation on Large Decapod Resources (Taku Sato, Fish. Res. Agen., Japan)
- Conservation biology of freshwater crayfishes. –new challenges from Japan, Eastern Asia (Tadashi Kawai, Wakkanai Fisheries Experimental Station) H

Akira Asakura
Senior Researcher, Crustacea
Zoology Department
Natural History Museum and Institute
Chiba, JAPAN
tokyotcs@yahoo.co.jp

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Cray expectations looking up

Researchers have found new evidence to suggest the Tasmanian giant freshwater crayfish may soon recover from the threat of extinction. Conservationist Todd Walsh has been searching for the elusive giant freshwater crayfish since childhood. About 16 years ago, that task was almost impossible because land clearing, mining and drought had decimated the crayfish population but, after nearly two decades on the vulnerable list, the species is making a comeback.

"The old 10 pounders are coming back, that's a big thing," Mr. Walsh explained. "Give it another 10 years, we might see the massive five to six kilo ones that used to exist."

Mr. Walsh says the community is now more aware of the need to protect the species. "There's been some new rules applied to forestry operations and those rules are being followed, so hats off to them as well." Dr. Alistair Richardson from the University of Tasmania says the crayfish are mating younger and growing a little faster than expected.

Several new water pipelines in the state's north are expected to support the crayfish revival by pumping water back into dry areas. Hydro Tasmania is to study how water diverted from the Meander dam affects the crayfish. H

By Annah Yard
ABC Science Online

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